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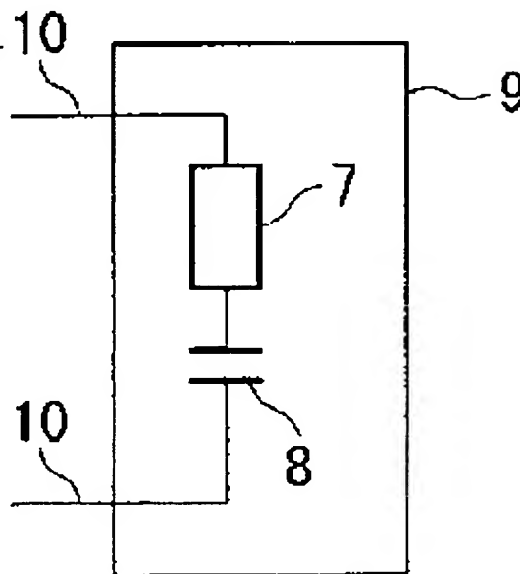
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(54) POWER-LINE CARRIER COMMUNICATION TERMINATING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent reflection and attenuation of a communication signal in an indoor power line to be used in power-line carrier communication.

SOLUTION: The impedance consisting of the serial circuit of a termination resistor 7 and an electrostatic capacitor 8, which is equivalent to a characteristic impedance of the indoor power lines 4 in the used frequency band of power-line carrier communication, is stored in a case 9 insertable to an outlet 4A of the indoor power line 4.



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CLAIMS

[Claim(s)]

[Claim 1] The terminating set for power line carrier communication characterized by the impedance which consists of a terminator equivalent to the characteristic impedance between the inside-of-a-house power lines in the use frequency band of power line carrier communication and a series circuit of electrostatic capacity being contained by the plug socket of the inside-of-a-house power line in the case in which a plug is possible.

[Claim 2] The terminating set for power line carrier communication according to claim 1 characterized by connecting the common mode choke coil to juxtaposition to the series circuit of said terminator and electrostatic capacity.

[Claim 3] The terminating set for power line carrier communication according to claim 1 characterized by connecting the thunder protection component of an electrical-potential-difference oppression mold to juxtaposition to the series circuit of said terminator and electrostatic capacity.

[Claim 4] The terminating set for power line carrier communication according to claim 1 characterized by connecting the fuse to a serial to the series circuit of said terminator and electrostatic capacity.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the terminating set for power line carrier communication which prevents an echo and attenuation of the signal transmission in power line carrier communication.

[0002]

[Description of the Prior Art] As a communication mode using the power line or an electric light line, there is a power-line-carrier-communication method which uses the power line as the transmission line of signal transmission. Moreover, generally a single phase 3 line method is used as a wiring method of the power line in a residence, and power line carrier communication can be performed using the power line by superimposing said signal transmission of a RF on the AC signal between 2 lines of the power line. Drawing 6 is the circuit diagram showing the concept of this power line carrier communication, and is set to this drawing. The inside-of-a-house power line with which a fiber optic cable and 3 were drawn in the signal converter, and 4 was drawn [1] for a source power supply and 2 in each domestic one, The plug (it has expressed with the line on drawing) of electrical machinery and apparatus, such as a home product and communication equipment, and 4A are the plug sockets by the side of the inside-of-a-house power line 4 for, as for 5, electrical machinery and apparatus, such as home electronics or communication equipment, being inserted, and, as for 6, said plug 6 being inserted, and supplying power to a home product or communication equipment from the inside-of-a-house power line 4. Said signal converter 3 changes into an electrical-communication signal the signal transmission transmitted as a lightwave signal on a fiber optic cable 2, the electrical-communication signal transmitted through the inside-of-a-house power line 4 is changed into a lightwave signal from the communication equipment which was overlapped to the inside-of-a-house power line 4, or was connected to (going down) and the inside-of-a-house power line 4, and it has the function to transmit the signal through a fiber optic cable 2 (going up).

[0003] The characteristic impedance of the inside-of-a-house power line 4 in the frequency band of power line carrier communication is several 10ohms - about 100ohms in general, and when signal transmission is impressed among 2 lines of the inside-of-a-house power line 4, that signal transmission spreads it to the transmission line which consists of this inside-of-a-house power line 4. However, the impedance between the inside-of-a-house power lines 4 of the device with which the communication link connected to this inside-of-a-house power line 4 is not presented is changed according to the class of device, and has frequency characteristics further. For this reason, when signal transmission arrives at the device with which a communication link is not presented, an echo and attenuation occur by the mismatching of an impedance. Moreover, if plug socket 4A of the inside-of-a-house power line 4 is in the open condition or a branching part is in the inside-of-a-house power line 4, since an echo and attenuation of signal transmission will occur, degradation of signal transmission occurs.

[0004]

[Problem(s) to be Solved by the Invention] Thus, in the conventional power line carrier communication, the inside-of-a-house power line 4 changed into the open condition in the plug socket 4A section, or branched, by not carry out adjustment termination, an echo and attenuation of

signal transmission occurred by the mismatching of an impedance again, and, for this reason, there was a problem of a communication link become impossible depending on the configuration and wiring gestalt of a facility. Furthermore, like a communication wire that is, since it was not the balanced cable of a couple by-two round trip, unbalance was bad, therefore the signal echo became large, the electromagnetic radiation from the inside-of-a-house power line 4 became large by this, and the inside-of-a-house power line 4 had the problem of doing electromagnetic interference to a surrounding electric product and communication equipment.

[0005] The place which this invention solves the above conventional problems and is made into the object is connecting an impedance equal to the characteristic impedance in the frequency of power line carrier communication to the plug socket used as the receiving end of the inside-of-a-house power line, and is to offer the terminating set for power line carrier communication which can prevent easily an echo and attenuation of the signal transmission in the trailer of the inside-of-a-house power line.

[0006]

[Means for Solving the Problem] The terminating set for power line carrier communication applied to invention of claim 1 for the aforementioned object achievement is characterized by containing the impedance which consists of a terminator equivalent to the characteristic impedance between the inside-of-a-house power lines in the activity frequency band of power line carrier communication, and a series circuit of electrostatic capacity to the plug socket of the inside-of-a-house power line in the case in which a plug is possible. The characteristic impedance as the transmission line for carrier frequency communication which consists of the inside-of-a-house power line can be stabilized by this, objection and attenuation of the signal transmission in the trailer of the inside-of-a-house power line can be prevented, and the electromagnetic radiation from the inside-of-a-house power line to a peripheral device and failure of the communication equipment by this can be avoided.

[0007] Moreover, the terminating set for power line carrier communication concerning invention of claim 2 is characterized by connecting the common mode choke coil to juxtaposition to the series circuit of said terminator and electrostatic capacity. the common mode noise which the unbalance between the inside-of-a-house power lines is raised, and is produced between each inside-of-a-house power line to a gland by this -- removable -- the electromagnetism from the inside-of-a-house power line -- radiation and this electromagnetism of a noise -- trespass to the peripheral device of a noise can be suppressed.

[0008] Moreover, the terminating set for power line carrier communication concerning invention of claim 3 is characterized by connecting the thunder protection component of an electrical-potential-difference oppression mold to juxtaposition to the series circuit of said terminator and electrostatic capacity. The lightning surge generated between the inside-of-a-house power lines and the switching surge of a device are made to absorb by this, and it can prevent effectively that home electronics and communication equipment break.

[0009] Moreover, the terminating set for power line carrier communication concerning invention of claim 4 is characterized by connecting the fuse to a serial to the series circuit of said terminator and electrostatic capacity. Thereby, when the terminator and electrostatic capacity as a termination means carry out closed-circuit failure by a certain cause, it can avoid beforehand the short-circuit current of commercial frequency flowing to these, and failure being expanded, or producing generation of heat and damaging by fire.

[0010]

[Embodiment of the Invention] Below, the gestalt of operation of this invention is explained about drawing. Drawing 1 is the circuit diagram showing the terminating set for power line carrier communication of this invention. In this drawing, it is the electrostatic capacity by which 7 was made the terminator and the series connection of 8 was carried out to this terminator 7, and these have an impedance equivalent to the characteristic impedance between the inside-of-a-house power lines 4 in the activity frequency band of power line carrier communication. Moreover, such terminators 7 and electrostatic capacity 8 are contained in the small insulating case 9. The plug (it has expressed only with the line on drawing) 10 with the connection terminal of the couple connected with the ends of the circuit which carried out the series connection of a terminator 7 and the electrostatic capacity 8 protrudes on the 1 side of this case 9, and a plug is free to plug socket 4A

of one which has this plug 10 in indoor as shown in drawing 6 of openings. Moreover, although an aforementioned terminator 7 and electrostatic capacity 8 show the high impedance more than several micro-ohm, they constitute the terminator machine of an impedance equivalent to the characteristic impedance between the inside-of-a-house power lines 4 from commercial frequency in the frequency band used by power line carrier communication.

[0011] Therefore, the termination for power line carrier communication is realizable by inserting the plug 10 of said case 9 in plug socket 4A of the inside-of-a-house power line 4, and also when it arrives at the power device with which signal transmission does not present communication equipment, an echo and attenuation of the signal transmission by the mismatching of an impedance can be prevented. Also when similarly a branching part is in the case where plug socket 4A of the inside-of-a-house power line 4 is in the open condition, or the inside-of-a-house power line 4, by inserting the plug 10 with this terminator machine in plug socket 4A, an echo and attenuation of said signal transmission can be avoided, and degradation of the communication link information transmitted can be prevented.

[0012] Drawing 2 is the circuit diagram showing the terminating set for power line carrier communication by other gestalten of operation of this invention. the noise from the outside should invade into a device, or the inside-of-a-house power line 4 of an alternating current should be connected with this inside-of-a-house power line 4 -- the noise generated in ***** becomes the path from which it leaks to the exterior. Generally the common noise produced between the two inside-of-a-house power lines 4 and a gland poses a problem among this noise. To this common noise, it has a large inductance, and the common mode choke coil 11 which negates magnetic flux mutually to the alternating voltage of commercial frequency is used. In this invention, parallel connection of this common mode choke coil 11 was carried out to the series circuit of a terminator 7 and electrostatic capacity 8, and these are contained in one case 9. Therefore, while raising the unbalance of the inside-of-a-house power line 4 and being able to control an echo and attenuation of signal transmission by inserting the plug 10 of this case 9 in plug socket 4A, the noise on this inside-of-a-house power line 4 is absorbed, and the leak of the noise to the electromagnetic radiation and the exterior from this inside-of-a-house power line 4 can be reduced.

[0013] Drawing 3 is the circuit diagram showing the terminating set for power line carrier communication by other gestalten of operation of this invention. the inside-of-a-house power line 4 - - thunder-ed, failure of a device, etc. -- being momentary (several microseconds) -- shocking surge current may flow This surge current has a possibility of destroying the terminator machine containing the device connected to the inside-of-a-house power line 4, said terminator 7, or electrostatic capacity 8. For this reason, in this invention, the thunder protection component 12 of electrical-potential-difference oppression molds, such as a lightning arrester, is connected to juxtaposition to the series circuit of a terminator 7 and electrostatic capacity 8. Thereby, it can prevent beforehand that the terminator machine connected to the inside-of-a-house power line 4 and a home electrical-and-electric-equipment product are destroyed according to surge current, such as a lightning surge generated between the inside-of-a-house power lines 4.

[0014] Drawing 4 is the circuit diagram showing the terminating set for power line carrier communication by other gestalten of operation of this invention. The terminator 7 and electrostatic capacity 8 which constitute a terminator machine are a certain cause, for example, closed-circuit failure may be carried out according to poor insulation etc. Since this closed-circuit failure may cause flame generating by generation of heat by the overcurrent, it is necessary to open this terminator machine from the inside-of-a-house power line 4 promptly. In this invention, the series connection of the fuse 13 which is a simple current cutoff component has been carried out to the series circuit of a terminator 7 and electrostatic capacity 8. It is avoidable that said terminator machine breaks down according to said overcurrent by making a fuse 13 melt with the Joule's heat which this generates according to the overcurrent which flows at the time of generating of said closed-circuit failure.

[0015] Drawing 5 shows the example which connected the thunder protection component 12 of an electrical-potential-difference control mold to the circuit shown in drawing 4 . According to this, destruction of the terminator machine by the lightning surge which described drawing 3 and drawing 4 , or a home electrical-and-electric-equipment product can be prevented beforehand.

[0016]

[Effect of the Invention] As mentioned above, since the impedance which consists of a terminator equivalent to the characteristic impedance between the inside-of-a-house power lines in the activity frequency band of power line carrier communication and a series circuit of electrostatic capacity was contained to the plug socket of the inside-of-a-house power line in the case in which a plug is possible according to this invention, the characteristic impedance of the transmission line for carrier frequency communication is stabilized, objection and attenuation of signal transmission are prevented, and the effectiveness that the failure by the electromagnetic radiation from the inside-of-a-house power line to a peripheral device is avoidable is acquired.

[0017] moreover, the common mode noise which the unbalance between the inside-of-a-house power lines is raised, and is produced between each inside-of-a-house power line to a gland since the common mode choke coil was arranged in parallel in the series circuit of said terminator and electrostatic capacity -- removable -- the electromagnetism from the inside-of-a-house power line -- radiation and this electromagnetism of a noise -- trespass to the peripheral device of a noise can be suppressed.

[0018] Furthermore, since parallel connection of the thunder protection component of an electrical-potential-difference oppression mold was carried out to the series circuit of said terminator and electrostatic capacity, the lightning surge generated between the inside-of-a-house power lines and the switching surge of a device are made to absorb, and it can prevent effectively that home electronics and communication equipment break. And when the series connection of the fuse is carried out to the series circuit of said terminator and electrostatic capacity and the terminator and electrostatic capacity as a termination means carry out closed-circuit failure by a certain cause, it can avoid beforehand the short-circuit current of commercial frequency flowing to these, and failure being expanded or producing generation of heat.

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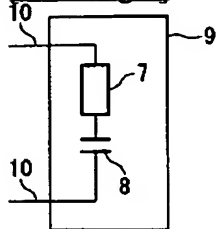
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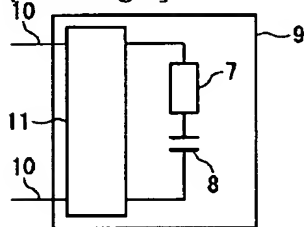
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DRAWINGS

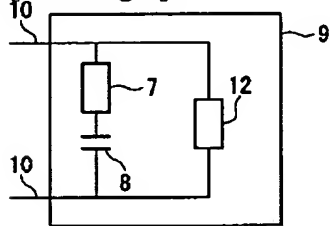
[Drawing 1]



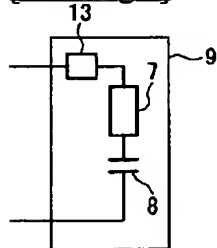
[Drawing 2]



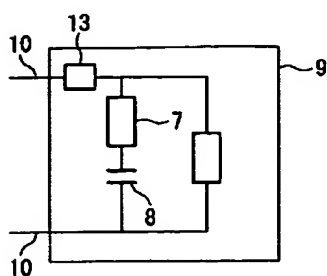
[Drawing 3]



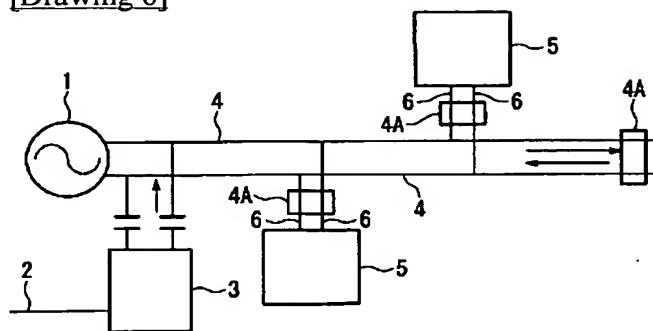
[Drawing 4]



[Drawing 5]



[Drawing 6]



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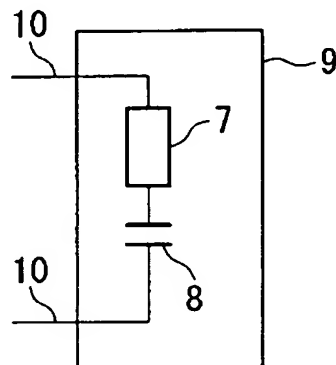
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(54) 【発明の名称】 電力線搬送通信用終端装置

(57) 【要約】

【課題】 電力線搬送通信で使用する屋内電力線における通信信号の反射・減衰を防止可能にする。

【解決手段】 電力線搬送通信の使用周波数帯域における屋内電力線 4 間の特性インピーダンスと等価な終端抵抗 7 と静電容量 8 の直列回路とからなるインピーダンスが、屋内電力線 4 のコンセント 4 A に対し差し込み可能なケース 9 内に収納されている。



【特許請求の範囲】

【請求項 1】 電力線搬送通信の使用周波数帯域における屋内電力線間の特性インピーダンスと等価な終端抵抗と静電容量の直列回路とからなるインピーダンスが、屋内電力線のコンセントに差し込み可能なケース内に収納されていることを特徴とする電力線搬送通信用終端装置。

【請求項 2】 前記終端抵抗と静電容量の直列回路に対して、コモンモードチョークコイルが並列に接続されていることを特徴とする請求項 1 に記載の電力線搬送通信用終端装置。

【請求項 3】 前記終端抵抗と静電容量の直列回路に対して、電圧抑圧型の雷防護素子が並列に接続されていることを特徴とする請求項 1 に記載の電力線搬送通信用終端装置。

【請求項 4】 前記終端抵抗と静電容量の直列回路に対して、ヒューズが直列に接続されていることを特徴とする請求項 1 に記載の電力線搬送通信用終端装置。

【発明の詳細な説明】**【0001】**

【発明の属する技術分野】 本発明は、電力線搬送通信における通信信号の反射・減衰を防止する電力線搬送通信用終端装置に関するものである。

【0002】

【従来の技術】 電力線または電灯線を用いた通信方式として、電力線を通信信号の伝送線路として用いる電力線搬送通信方式がある。また、住宅内の電力線の配線方式として単相 3 線方式が一般的に用いられ、電力線の 2 線間の交流信号に高周波の前記通信信号を重畳すること、電力線を用いて電力線搬送通信を行うことができる。図 6 はこの電力線搬送通信の概念を示す回路図であり、同図において、1 は商用電源、2 は光ファイバケーブル、3 は信号変換器、4 は各家庭内に引き込まれた屋内電力線、5 は家電製品または通信機器などの電気機器、6 は家庭製品や通信機器などの電気機器のプラグ（図上、線で表わしてある）、4A は前記プラグ 6 が差し込まれて、屋内電力線 4 から家庭製品や通信機器に電力を供給するための屋内電力線 4 側のコンセントである。前記信号変換器 3 は光ファイバケーブル 2 上に光信号として伝送されてきた通信信号を電気通信信号に変換して、屋内電力線 4 へ重畳したり（下り）、屋内電力線 4 に接続された通信機器から屋内電力線 4 を介して送信されてきた電気通信信号を光信号に変換し、光ファイバケーブル 2 を通じてその信号を送信する機能を有している（上り）。

【0003】 電力線搬送通信の周波数帯域における屋内電力線 4 の特性インピーダンスは概ね数 $10\Omega \sim 100\Omega$ 程度であり、通信信号が屋内電力線 4 の 2 線間に印加された場合には、この屋内電力線 4 からなる伝送線路にその通信信号が伝搬する。ところが、この屋内電力線 4

に接続される通信に供しない機器の屋内電力線 4 間のインピーダンスは機器の種類によって変動し、さらに周波数特性を有する。このため、通信信号が通信に供しない機器に到来した場合、インピーダンスの不整合により反射・減衰が発生する。また、屋内電力線 4 のコンセント 4A が開放状態となっていたり、屋内電力線 4 に分岐箇所があったりすると、通信信号の反射・減衰が発生するため、通信信号の劣化が発生する。

【0004】

【発明が解決しようとする課題】 このように、従来の電力線搬送通信では屋内電力線 4 がコンセント 4A 部で開放状態となったり分岐されたりして整合終端されていないことにより、またインピーダンスの不整合により通信信号の反射・減衰が発生し、このため、設備の構成や配線形態によっては通信ができなくなるという問題があった。さらに、屋内電力線 4 は、通信線のように、つまり往復 2 本で一对の平衡ケーブルとなっていないため平衡度が悪く、従って信号反射が大きくなり、これにより屋内電力線 4 からの電磁放射が大きくなり、周辺の電気製品や通信機器に電磁障害を与えるという問題があった。

【0005】 本発明は、前記のような従来の問題を解決するものであり、その目的とするところは、屋内電力線 4 の受電端となるコンセントに電力線搬送通信の周波数における特性インピーダンスに等しいインピーダンスを接続することで、屋内電力線 4 の終端部における通信信号の反射・減衰を簡単に防止できる電力線搬送通信用終端装置を提供することにある。

【0006】

【課題を解決するための手段】 前記の目的達成のために、請求項 1 の発明にかかる電力線搬送通信用終端装置は、電力線搬送通信の使用周波数帯域における屋内電力線間の特性インピーダンスと等価な終端抵抗と静電容量の直列回路とからなるインピーダンスが、屋内電力線のコンセントに対し差し込み可能なケース内に収納されていることを特徴とする。これにより、屋内電力線 4 からなる搬送通信の伝送線路としての特性インピーダンスを安定化して、屋内電力線 4 の終端部での通信信号の反対・減衰を防止し、屋内電力線 4 から周辺機器への電磁放射およびこれによる通信機器の故障を回避することができる。

【0007】 また、請求項 2 の発明にかかる電力線搬送通信用終端装置は、前記終端抵抗と静電容量の直列回路に対して、コモンモードチョークコイルが並列に接続されていることを特徴とする。これにより、屋内電力線間の平衡度を向上させて、グラウンドに対して各屋内電力線間に生じるコモンモードノイズを除去でき、屋内電力線 4 から電磁ノイズの放射およびこの電磁ノイズの周辺機器への侵入を抑えることができる。

【0008】 また、請求項 3 の発明にかかる電力線搬送通信用終端装置は、前記終端抵抗と静電容量の直列回路

に対して、電圧抑圧型の雷防護素子が並列に接続されていることを特徴とする。これにより、屋内電力線間に発生する雷サージや機器の開閉サージを吸収させて、家電製品や通信機器が破壊するのを効果的に防止できる。

【0009】また、請求項4の発明にかかる電力線搬送通信用終端装置は、前記終端抵抗と静電容量の直列回路に対して、ヒューズが直列に接続されていることを特徴とする。これにより、終端手段としての終端抵抗や静電容量が何らかの原因で短絡故障した場合に、これらに商用周波数の短絡電流が流れて故障が拡大したり、発熱を生じて焼損したりするのを未然に回避することができる。

【0010】

【発明の実施の形態】以下に、本発明の実施の形態を図について説明する。図1は本発明の電力線搬送通信用終端装置を示す回路図である。同図において、7は終端抵抗、8はこの終端抵抗7に直列接続された静電容量で、これらは電力線搬送通信の使用周波数帯域における屋内電力線4間の特性インピーダンスと等価なインピーダンスを持つ。また、これらの終端抵抗7および静電容量8は絶縁性の小形のケース9内に収納されている。このケース9の一側には、終端抵抗7および静電容量8を直列接続した回路の両端に繋る一対の接続端子を持ったプラグ（図上、線のみで表わしてある）10が突設されており、このプラグ10が、図6に示すような屋内にあるいずれかの空きのコンセント4Aに差し込み自在となっている。また、前記の終端抵抗7および静電容量8は商用周波数では数 $\mu\Omega$ 以上の高インピーダンスを示すものの、電力線搬送通信で使用する周波数帯域においては、屋内電力線4間の特性インピーダンスと等価なインピーダンスの終端抵抗器を構成する。

【0011】従って、前記ケース9のプラグ10を屋内電力線4のコンセント4Aに差し込むことによって電力線搬送通信用終端を実現でき、通信信号が通信機器に供しない電力機器などに到来した場合にも、インピーダンスの不整合によるその通信信号の反射・減衰を防止できる。同様にして、屋内電力線4のコンセント4Aが開放状態となっている場合や屋内電力線4に分岐箇所があるような場合にも、この終端抵抗器を持ったプラグ10をコンセント4Aに差し込むことで、前記通信信号の反射・減衰を回避でき、伝送される通信情報の劣化を防止できる。

【0012】図2は本発明の実施の他の形態による電力線搬送通信用終端装置を示す回路図である。交流の屋内電力線4は外部からのノイズが機器に侵入したり、この屋内電力線4に繋れた機器で発生するノイズが外部へ洩れたりする通路になる。このノイズのうち、一般的に問題となるのは、2本の屋内電力線4とグラウンドとの間に生じるコモンノイズである。このコモンノイズに対しては大きいインダクタンスを有し、商用周波数の交流電圧

に対しては互いに磁束を打ち消し合うようなコモンモードチョークコイル11を用いる。本発明では、このコモンモードチョークコイル11を、終端抵抗7および静電容量8の直列回路に対し並列接続して、これらを一つのケース9内に収納している。従って、このケース9のプラグ10をコンセント4Aに差し込むことにより、屋内電力線4の平衡度を向上させて通信信号の反射・減衰を抑制できるとともに、この屋内電力線4上のノイズを吸収して、この屋内電力線4からの電磁放射や外部へのノイズの洩れを低減できる。

【0013】図3は本発明の実施の他の形態による電力線搬送通信用終端装置を示す回路図である。屋内電力線4には、被雷や機器の故障などによって瞬時的（数マイクロ秒）に衝撃的なサージ電流が流れることがある。このサージ電流は屋内電力線4に接続された機器や、前記終端抵抗7や静電容量8を含む終端抵抗器を破壊するおそれがある。このため、本発明では、終端抵抗7および静電容量8の直列回路に対して避雷器などの電圧抑圧型の雷防護素子12を並列に接続している。これにより、屋内電力線4間に発生する雷サージなどのサージ電流によって、屋内電力線4に接続された終端抵抗器や家庭電気製品が破壊されるのを未然に防止することができる。

【0014】図4は本発明の実施の他の形態による電力線搬送通信用終端装置を示す回路図である。終端抵抗器を構成する終端抵抗7や静電容量8が何らかの原因で、例えば絶縁不良などによって短絡故障する場合がある。この短絡故障は過電流による発熱によって火災発生の原因となる場合があるので、迅速にこの終端抵抗器を屋内電力線4から開放する必要がある。本発明では、終端抵抗7および静電容量8の直列回路に対し、簡易的な電流遮断素子であるヒューズ13を直列接続してある。これにより、前記短絡故障の発生時に流れる過電流によって発生するジュール熱によりヒューズ13を溶断させることで、前記終端抵抗器が前記過電流によって故障するのを回避することができる。

【0015】図5は、図4に示す回路に電圧抑制型の雷防護素子12を接続した例を示す。これによれば、図3および図4について述べた雷サージによる終端抵抗器や家庭電気製品の破壊を未然に防止できる。

【0016】

【発明の効果】以上のように、本発明によれば電力線搬送通信の使用周波数帯域における屋内電力線間の特性インピーダンスと等価な終端抵抗と静電容量の直列回路とからなるインピーダンスを、屋内電力線のコンセントに対し差し込み可能なケース内に収納したので、搬送通信の伝送線路の特性インピーダンスを安定化して、通信信号の反対・減衰を防止し、屋内電力線から周辺機器への電磁放射による障害を回避することができるという効果が得られる。

【0017】また、前記終端抵抗と静電容量の直列回路

にコモンモードチョークコイルを並列したので、屋内電力線間の平衡度を向上させて、グラウンドに対して各屋内電力線間に生じるコモンモードノイズを除去でき、屋内電力線からの電磁ノイズの放射およびこの電磁ノイズの周辺機器への侵入を抑えることができる。

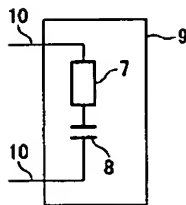
【0018】さらに、前記終端抵抗と静電容量の直列回路に電圧抑圧型の雷防護素子を並列接続したので、屋内電力線間に発生する雷サージや機器の開閉サージを吸収させて、家電製品や通信機器が破壊するのを効果的に防止できる。そして、前記終端抵抗と静電容量の直列回路にヒューズを直列接続した場合には、終端手段としての

【図面の簡単な説明】

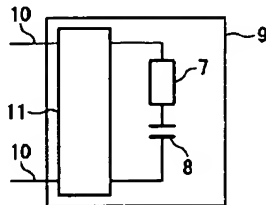
【図1】 本発明の実施の一形態による電力線搬送通信信用終端装置を示す回路図である。

【図2】 本発明の実施の他の形態による電力線搬送通信

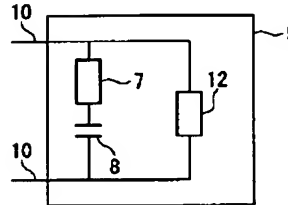
【図1】



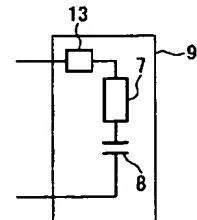
【図2】



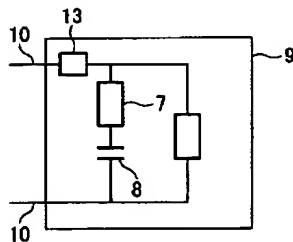
【図3】



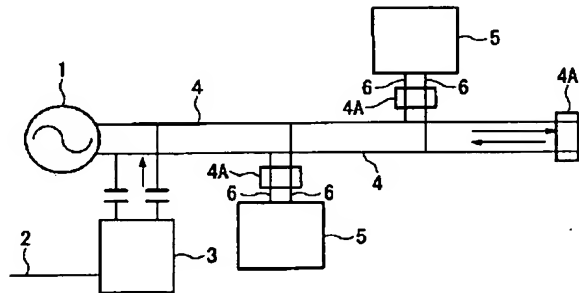
【図4】



【図5】



【図6】



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